

PATENT COOPERATION TREATY

PCT


INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 19 OCT 2005

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Applicant's or agent's file reference 4368PTWO/AG/la		FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/EP2004/051744		International filing date (day/month/year) 06.08.2004		Priority date (day/month/year) 08.08.2003
International Patent Classification (IPC) or national classification and IPC B21C47/12, B21C47/34, B65H54/28				
Applicant DANIELI & C. OFFICINE MECCANICHE S.P.A. et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 08.06.2005		Date of completion of this report 20.10.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Barrow, J Telephone No. +31 70 340-2636		



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/051744

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-8 as originally filed

Claims, Numbers

1-12 received on 04.07.2005 with letter of 29.06.2005

Drawings, Sheets

1/5-5/5 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/051744

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-12
	No: Claims	
Inventive step (IS)	Yes: Claims	1-12
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-12
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

1. The following document is referred to in this communication:

D1 : PATENT ABSTRACTS OF JAPAN vol. 1998, no. 11, 30 September
1998 (1998-09-30) & JP 10 157927 A (TAKANA DENKI:KK), 16 June 1998
(1998-06-16)

2. Document D1, which is considered to represent the most relevant state of the art, discloses (the references in parenthesis applying to this document):

A reeling device for rolled material (W) placed downstream of a rolling line, comprising at least one first guide element (47,57) and one second guide element (37), each of them defining a passage designed to guide said rolled material (W), where the first guide element (47,57) is designed at least to rotate about an axis that is substantially normal to its own plane of lie and comprises one input end adapted to receive said rolled material (W) coming off said rolling line, and one output end from which said rolled material (W) may come out, and where the second guide element (37) comprises one input end, set in the proximity of said output end of said first guide element (47,57), within which it is possible to introduce the rolled material (W) that has come out of the first guide element (47,57), and one output end, from which said rolled material may come out towards winding means (11) for winding the rolled material in turns, said winding means (11) defining a winding axis. and in which said first guide element (1) and said second guide element (2) are designed to vary their own inclination with respect to said winding axis (X) independently of one another at least according to a plane parallel to the axis (X).

From this, the subject-matter of independent claim 1 differs in that:

said first guide element (1) and said second guide element (2) are designed to vary their own inclination with respect to said winding axis (X) independently of one another at least according to a plane parallel to the axis (X).

- 2.1 The subject-matter of claim 1 is therefore novel (Article 33(2) PCT).
The problem to be solved by the present invention may be regarded as:

Providing a device for the winding of skeins with compact, cylindrical shape and high filling coefficient which avoids overlapping and subsequent damage of the turns.

- 2.2 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The independent variability of inclination with respect to the winding axis (X) of both first guide element (1) and second guide element (2) enables a much improved laying of turns of rolled material (BL) on the winding means. Furthermore as the rolled material is guided from a selected point with regard to rolling axis (AL) within a second tubular body (5), the inclination of which is guided near its output end (8) by carriage (11) the positive or negative inclination of the rolled material can be selected, in the prior art, the inclination of the rolled material was dependent on the tension of the rolled material between an output end of a guiding device and the point of contact with the rolling means.

- 2.3 Claims 2-7 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
3. Document D1, which is considered to represent the most relevant state of the art, discloses (the references in parenthesis applying to this document):

A method for reeling rolled material with a device, wherein there are defined a winding axis and a rolling axis, and a first guide element (47,57) and a second guide element (37), comprising an operation of displacing the output end of said second guide element (37) along said means for winding rolled material in turns, by causing the first guide element (47,57) to rotate at least about an axis substantially normal to its own plane of lie and maintaining said second guide element (37) with an inclination, on a first plane parallel to the winding axis.

From this, the subject-matter of independent claim 8 differs in that:

The first (1) and second (2) guide elements vary their respective inclination with respect to the winding axis (X) independently of one another, and in that the stretch of rolled material coming out of said output end (8) of said second guide element (2) has an angle of distribution (β_i), in said first plane substantially equal to the angle (α_i) of the helix of the turns of the layer being wound, wherein the angle (α_i) of the helix is inclined with respect to the rolling axis (AL) and the second guide element (2) varies its inclination with respect to the winding axis (X) during reeling.

3.1 The subject-matter of claim 8 is therefore novel (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as:

Performing a reeling operation which produces compact layers of rolled products at every point in every layer, including extremities of the reel.

3.2 The solution to this problem proposed in claim 8 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The ability to change the angle of inclination of the second guide means (2) allows the product being wound to be inclined at exactly the same angle as the previous winding already on the reel, thereby avoiding space between coils, furthermore since the coil is laid at the correct angle, coils need not impinge causing damage to the edges of the rolled product.

4. Claims 9-12 are dependent on claim 8 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

04. 07. 2005

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NEW CLAIMS

1. A reeling device for rolled material (BL) placed downstream of a rolling line, comprising at least one first guide element (1) and one second guide element (2), each of them defining a passage designed to support, contain and guide said rolled material (BL), where the first guide element (1) is designed at least to rotate about an axis that is substantially normal to its own plane of lie and comprises one input end adapted to receive said rolled material coming off said rolling line, and one output end from which said rolled material may come out, and where the second guide element (2) comprises one input end, set in the proximity of said output end of said first guide element (1), within which it is possible to introduce the rolled material that has come out of the first guide element (1), and one output end (8), from which said rolled material may come out towards winding means for winding the rolled material in turns, said winding means defining a winding axis (X), and in which said first guide element (1) and said second guide element (2) are designed to vary their own inclination with respect to said winding axis (X) independently of one another at least according to a plane parallel to the axis (X).
2. The device according to Claim 1, wherein the winding means comprise a spindle (M) of a reel.
3. The device according to Claim 2, wherein there are provided means of orientation of the second guide element (2) so as to maintain the stretch of said rolled material coming out of said output end (8) of said second guide element (2) substantially with the same inclination as that of the last turn wound on said spindle according to a plane parallel to the winding axis (X) of said turns.
4. The device according to one or more preceding claims, wherein there are provided at least one first mobile support (10) and one second mobile support (11) designed to translate in the direction parallel to the winding axis (X), and said second guide element (2) is supported by said second mobile support (11) substantially in the proximity of or in a position corresponding to said output end (8) thereof, and is supported by said first mobile support (10) substantially in the proximity of or in a position corresponding to said input end thereof, and said first guide element (1) is supported by said first mobile support (10) substantially

in the proximity of or in a position corresponding to said output end thereof.

5. The device according to Claim 4, wherein said second mobile support (11) is provided with means designed to raise and lower the second guide element (2).

6. The device according to one or more preceding claims, wherein there is provided: a device (12) for guiding the rolled material, comprising a space for passage, set downstream of said output end (8) of said second guide element (2) and designed to be traversed by said rolled material (BL); at least four rolls (120, 121), arranged in twos at both sides of said space for passage; at least four rotating connecting rods (123), on each of which is fixed one of said rolls in such a way that said connecting rods by rotating are designed to move said rolls closer together and further away from one another at the sides of said rolled material when it passes through said space or gap; and control and actuation means designed to control and vary the position of said rolls (120, 121) at least in the horizontal direction so as to contain and guide laterally said rolled material.

7. The device according to Claim 6, wherein the device 12 comprises an idler roller (122), which has a function of guiding in a vertical direction the rolled material at output (8) from the second guide element (2).

8. A method for reeling rolled material with a device according to one or more of the preceding claims, wherein there are defined a winding axis (X) and a rolling axis (AL), and the first guide element (1) and the second guide element (2) vary their respective inclination with respect to the winding axis (X) independently of one another, comprising the operation of displacing the output end (8) of said second guide element (2) along said means for winding rolled material in turns, by causing the first guide element (1) to rotate at least about an axis substantially normal to its own plane of lie and maintaining said second guide element (2) with an inclination, on a first plane parallel to the winding axis (X), characterised in that the stretch of rolled material coming out of said output end (8) of said second guide element (2) has an angle of distribution (β_i), in said first plane substantially equal to the angle (α_i) of the helix of the turns of the layer being wound, wherein the angle (α_i) of the helix is inclined with respect to the rolling axis (AL) and the second guide element (2) varies its inclination with

respect to the winding axis (X) during reeling.

9. The method according to Claim 8, wherein the first guide element is made to rotate at least about said axis substantially normal to its own plane of lie as long as said output end of said first guide element is within a region of space substantially delimited by two end surfaces, each of which is orthogonal to the axis (X) of the winding means and passes in a position corresponding to one end of said winding means.
10. The method according to Claim 8, wherein it is envisaged to arrest said rotation of said first guide element (1) about said axis substantially normal to its own plane of lie when said output end of said first guide element (1) reaches one of said end surfaces (P1, P2), and wherein it is envisaged to cause said second guide element (2) to rotate subsequently about an axis substantially normal to its own plane of lie at least until the output end (8) of said second guide element (2) substantially reaches one end of said winding means.
11. The method according to one or more Claims 8 to 10, wherein it is envisaged to raise said second guide element (2) during winding so as to follow the increase in diameter of the reel.
12. The method according to one or more Claims 8 to 11, wherein there is envisaged an operation of control of the position of the rolls of said guide device (12) for guiding the rolled material so as to maintain substantially a gap not less than a predetermined value between said rolls and the sides of said rolled material.